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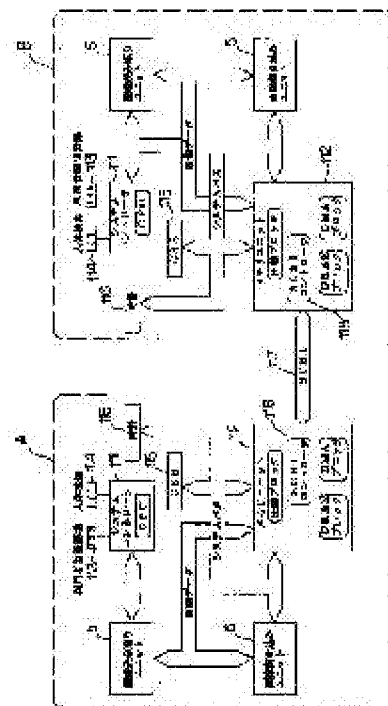
(72)Inventor : ISHIGURO HISASHI

(54) NETWORK SYSTEM OF IMAGE FORMING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a network system of an image forming device capable of shortening a copying time and enhancing the productivity, the use efficiency of the system.

SOLUTION: Plural digital copying devices A, B are connected with a network system of an image forming device through a communication means to communicate an operation command, a state, image information, etc. In the case of printing and outputting image data read by an operation machine by sharing the image data with another connected machine and, when the connected machine is under printing, the connected machine with the least number of remaining pages to be printed is selected and made to execute a printing operation by system controllers 111 of the digital copying machines. In addition, a time required for printing is calculated from the number of remaining pages to be printed and the sheet size, the connected machine with the least required time is selected and made to execute the printing operation.



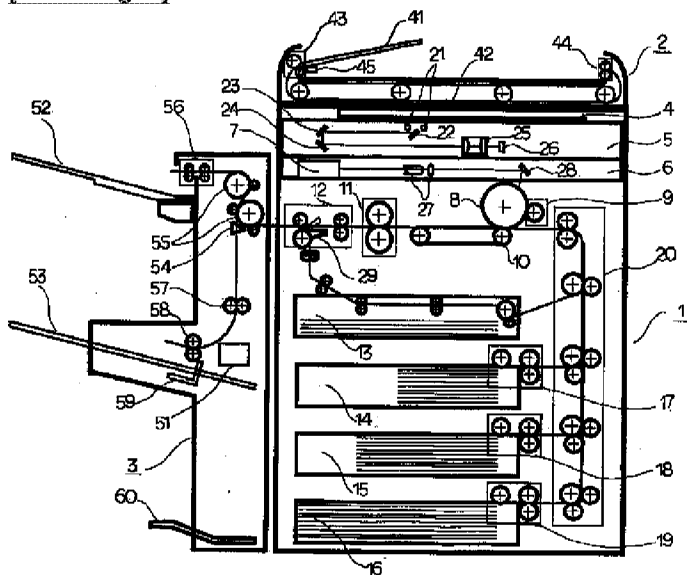
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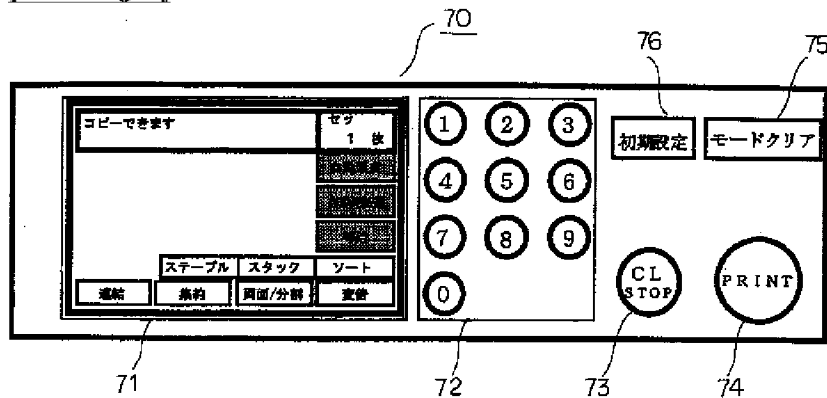
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DRAWINGS

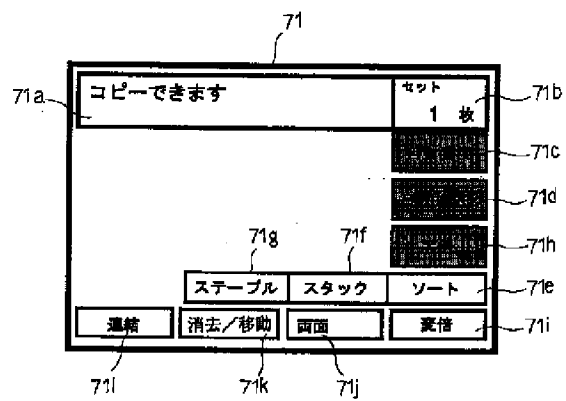
[Drawing 1]



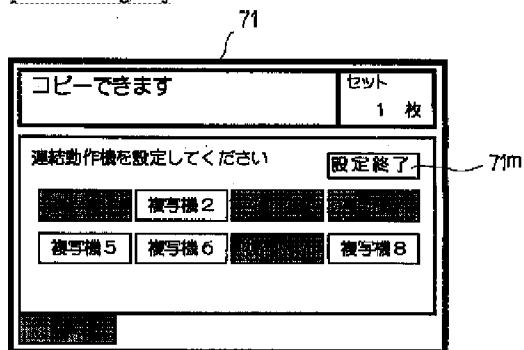
[Drawing 2]



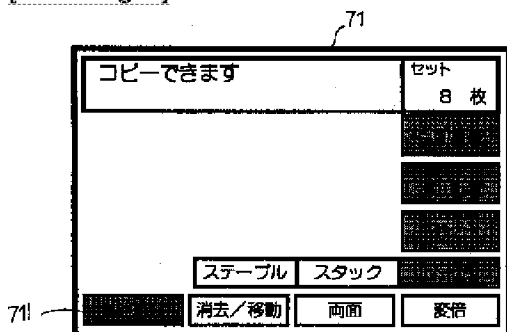
[Drawing 3]



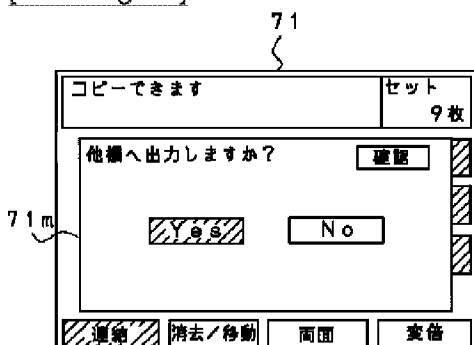
[Drawing 4]



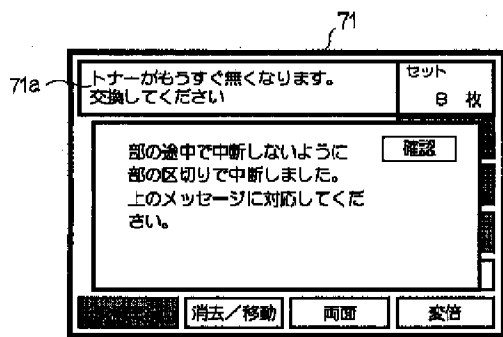
[Drawing 5]



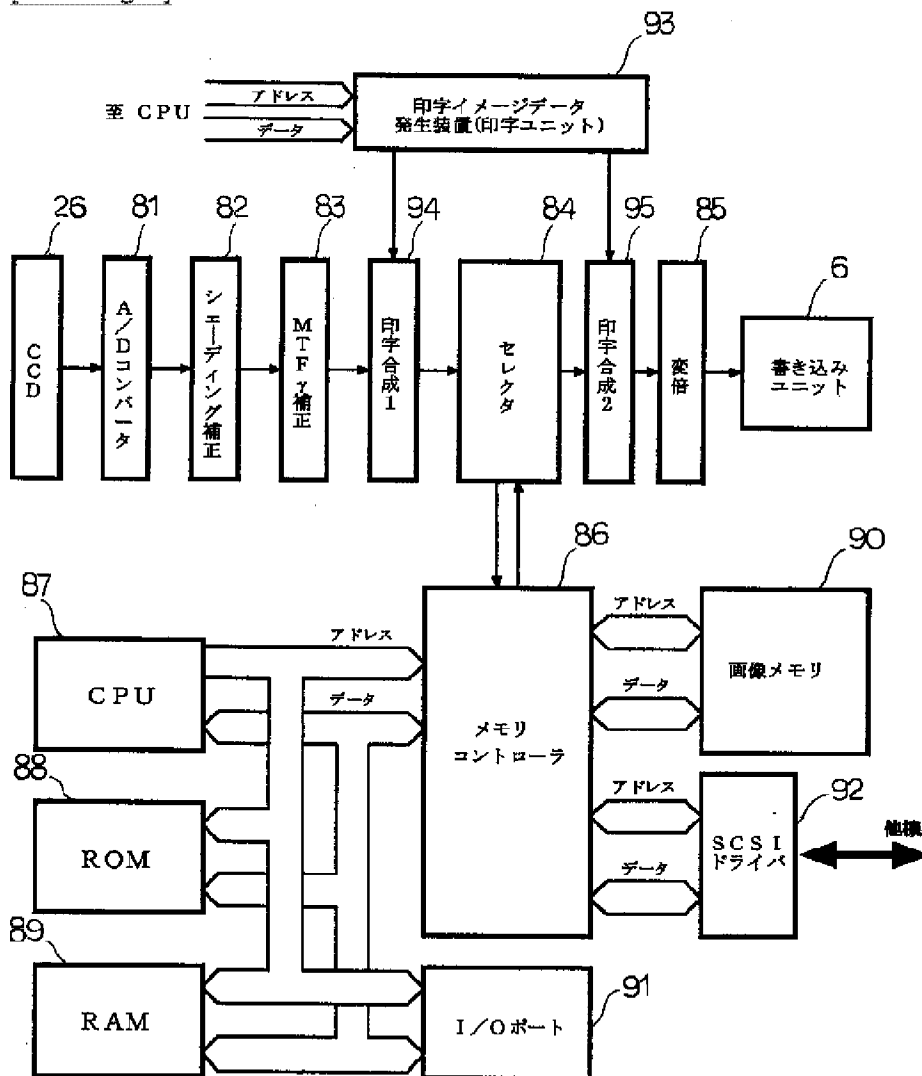
[Drawing 22]



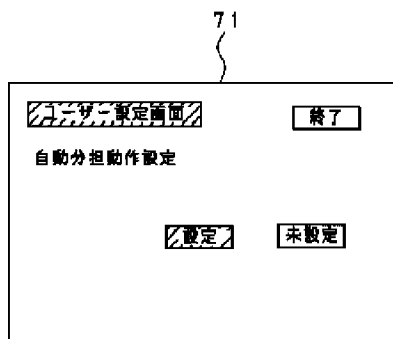
[Drawing 6]



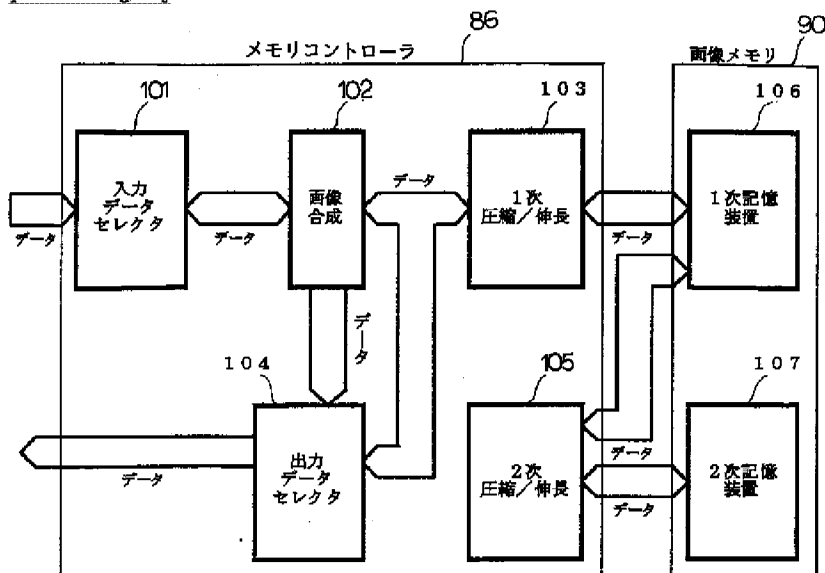
[Drawing 7]



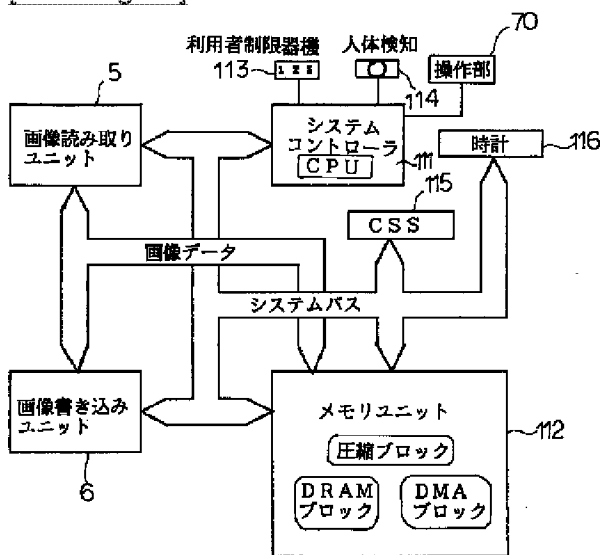
[Drawing 23]



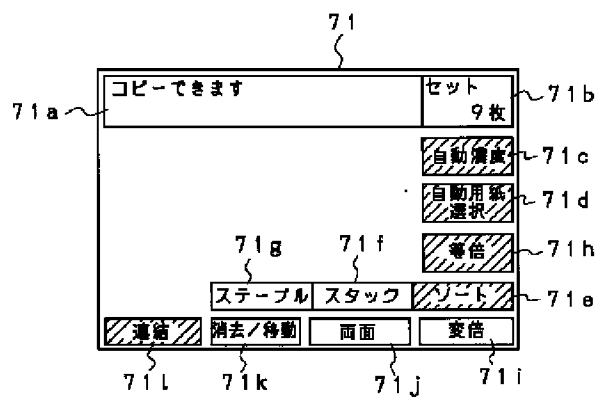
[Drawing 8]



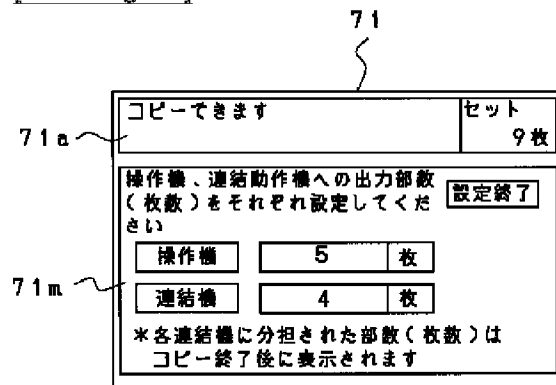
[Drawing 10]



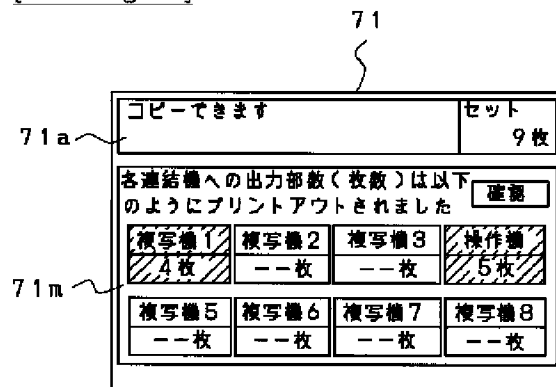
[Drawing 21]



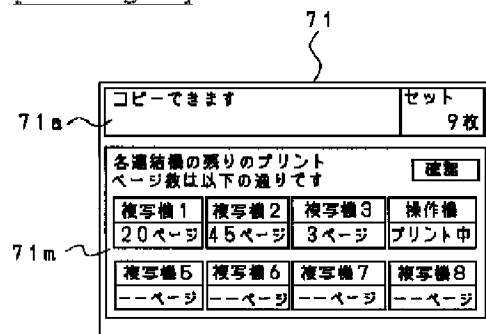
[Drawing 24]



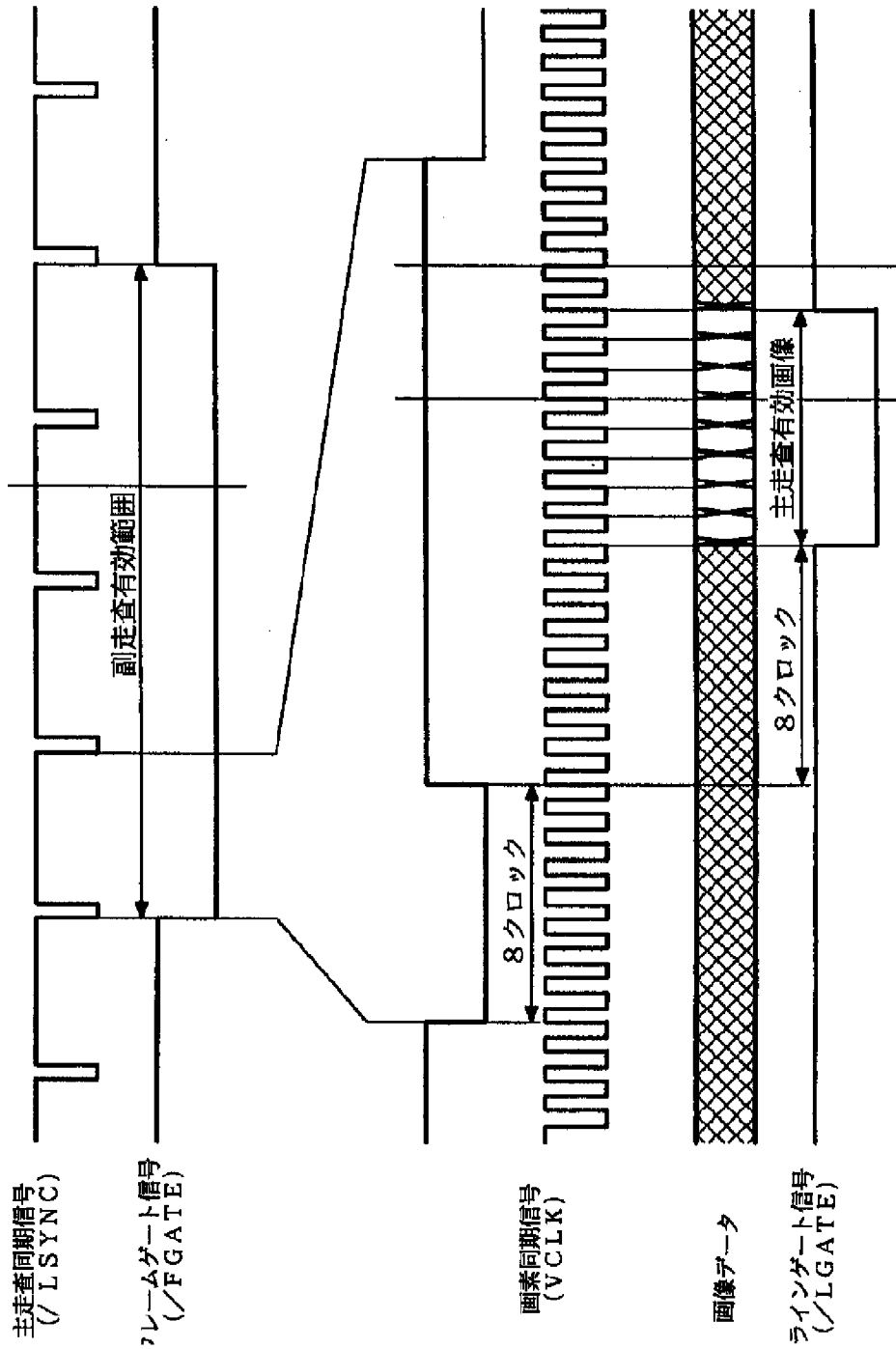
[Drawing 25]



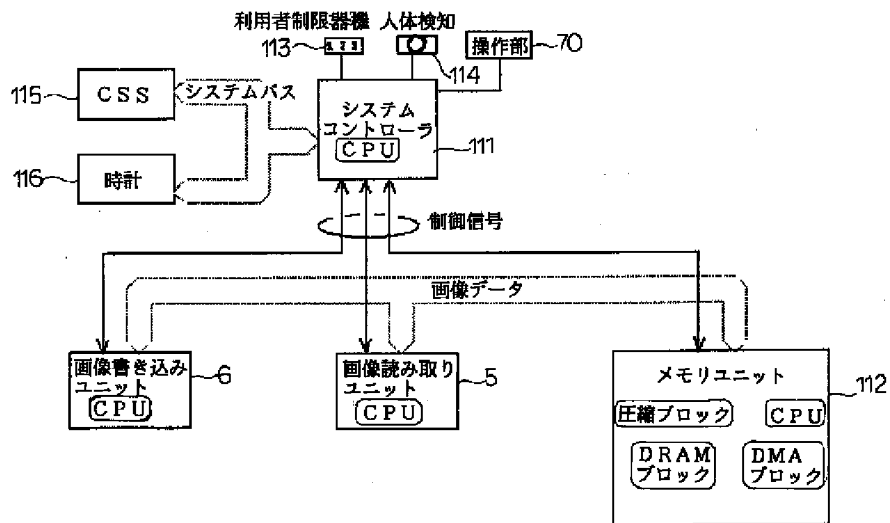
[Drawing 26]



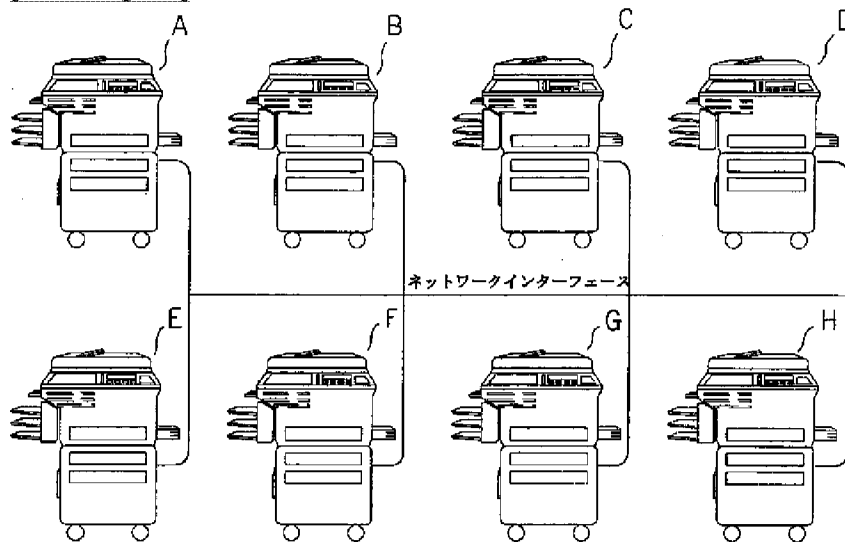
[Drawing 9]



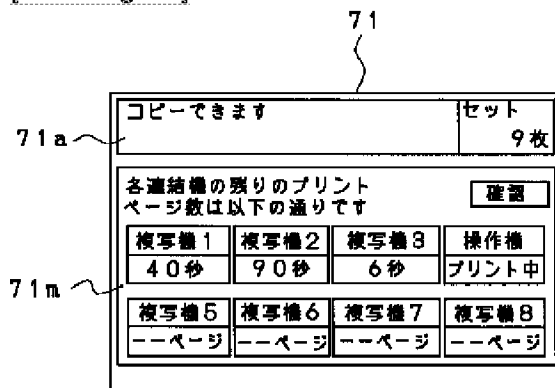
[Drawing 11]



[Drawing 12]



[Drawing 27]



[Drawing 28]

71

コピーできます		セット 9枚	
連結動作機を設定してください 設定終了			
複写機1	複写機2	複写機3	操作機
複写機5	複写機6	複写機7	複写機8

71a

71m

[Drawing 29]

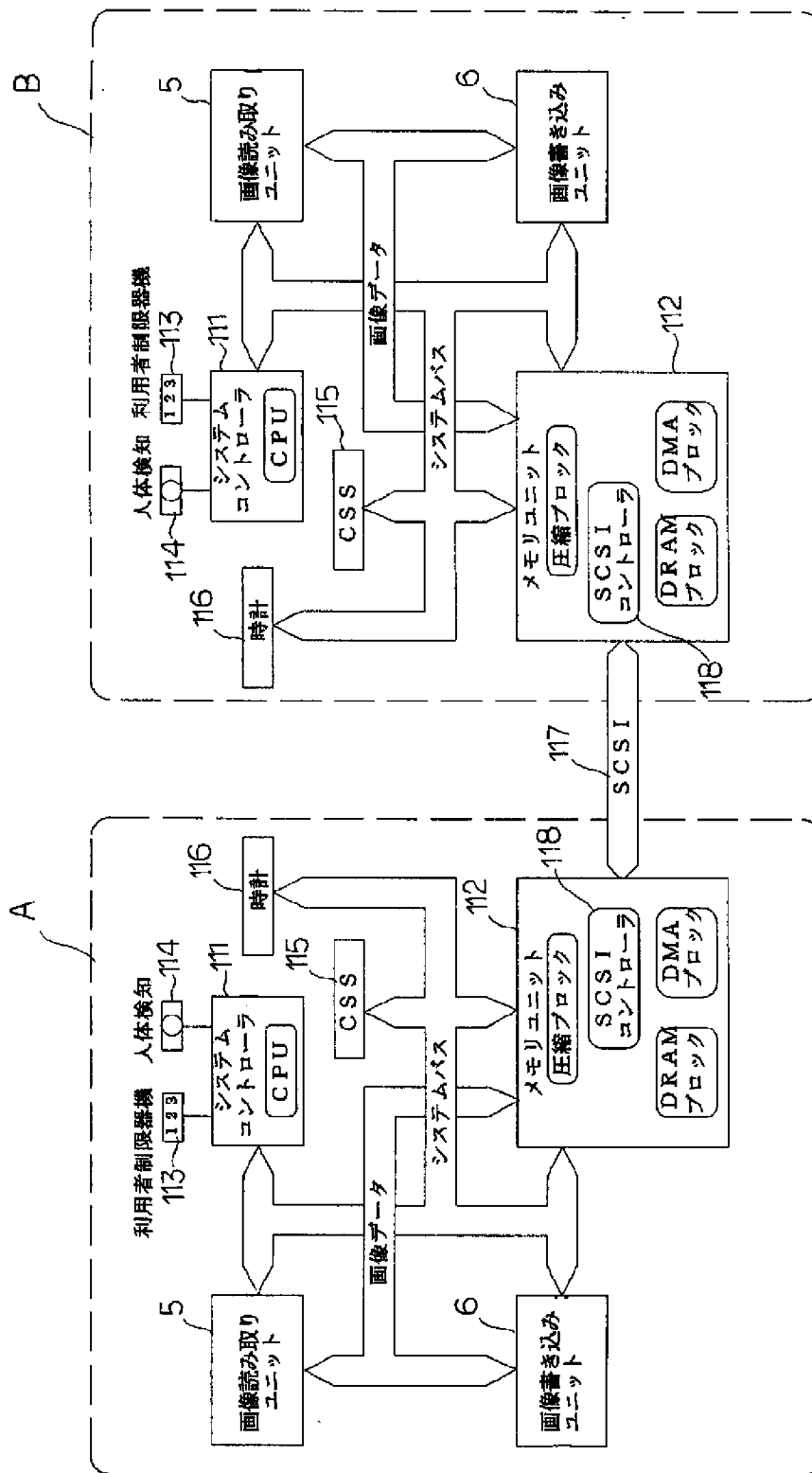
71

コピーできます		セット 9枚	
各連結機への出力部数（枚数） を設定してください 設定終了			
複写機1 2枚	複写機2 2枚	複写機3 2枚	操作機 3枚
複写機5 —枚	複写機6 —枚	複写機7 —枚	複写機8 —枚

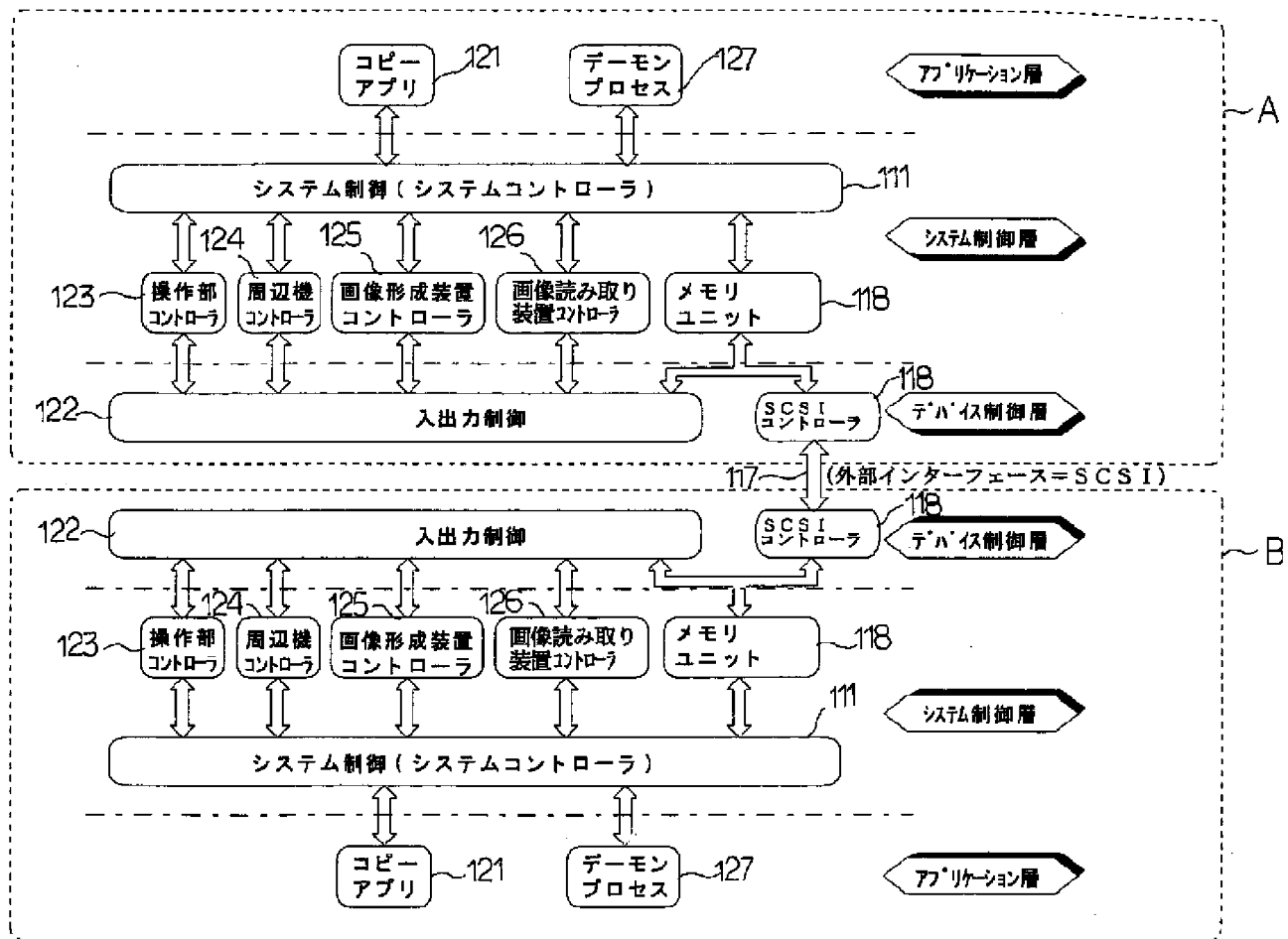
71a

71m

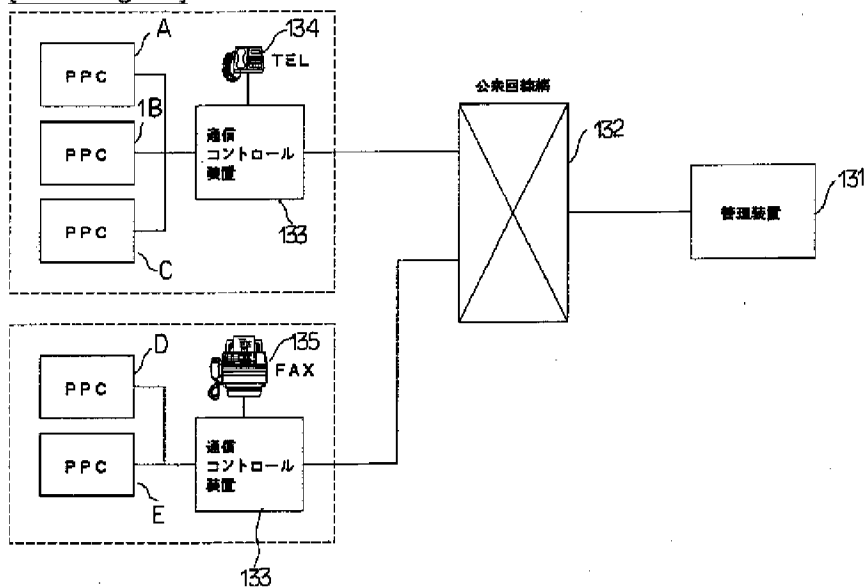
[Drawing 13]



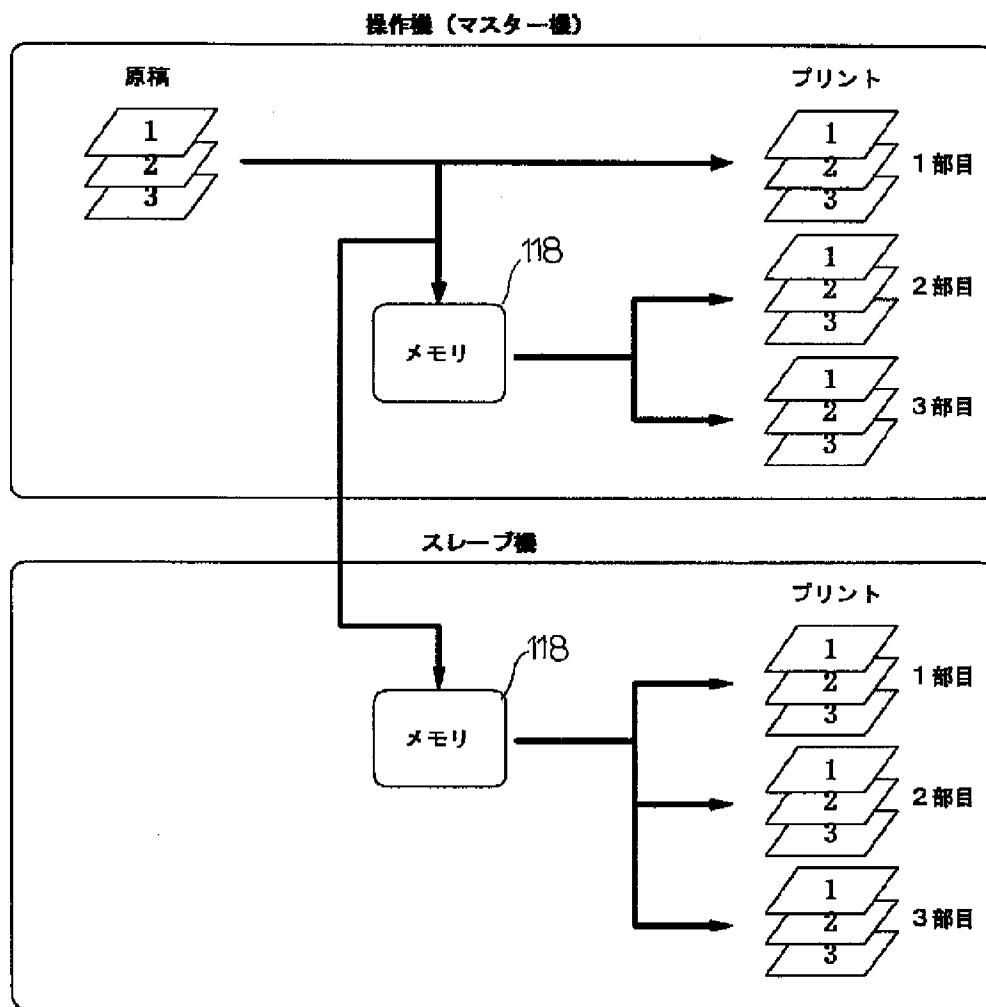
[Drawing 14]



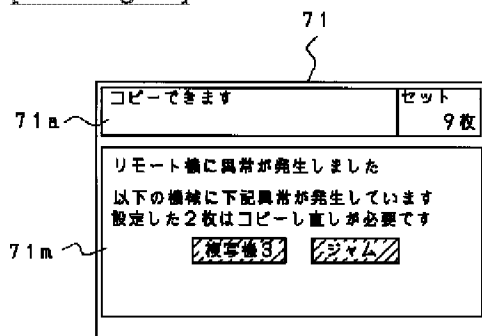
[Drawing 17]



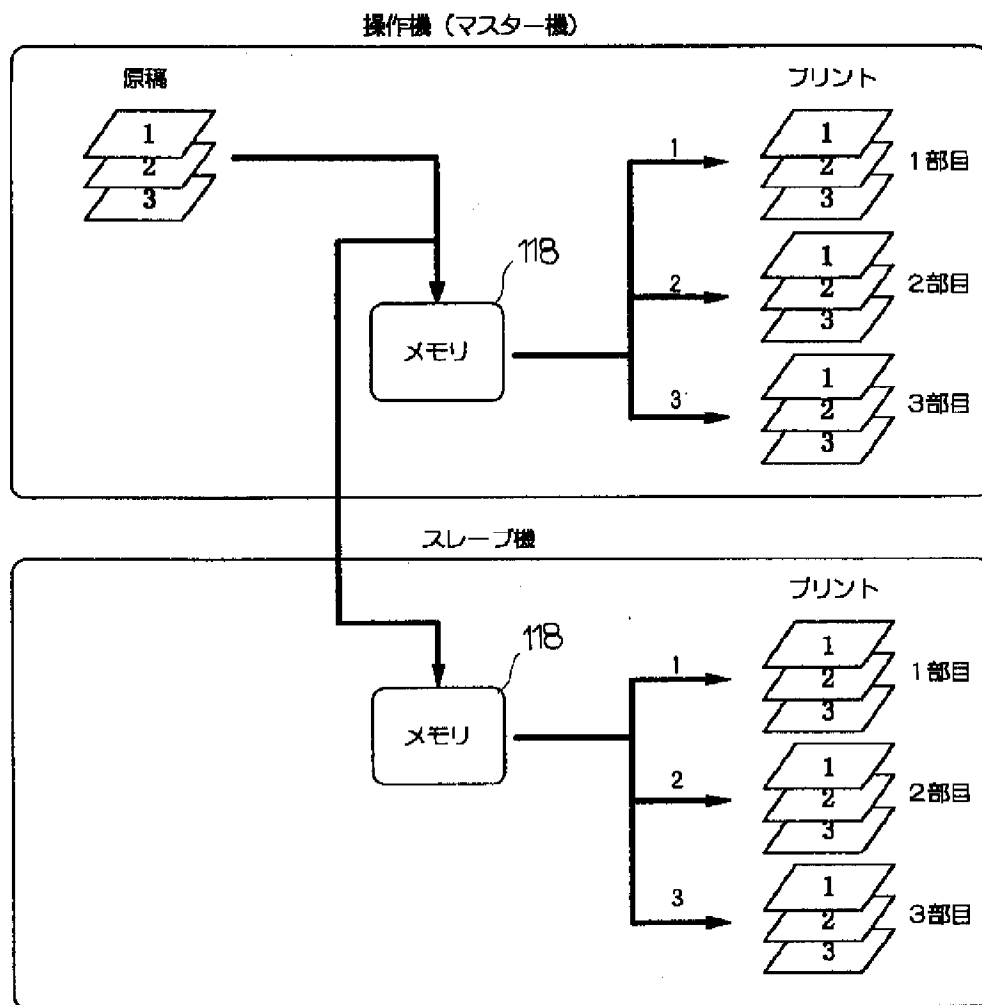
[Drawing 15]



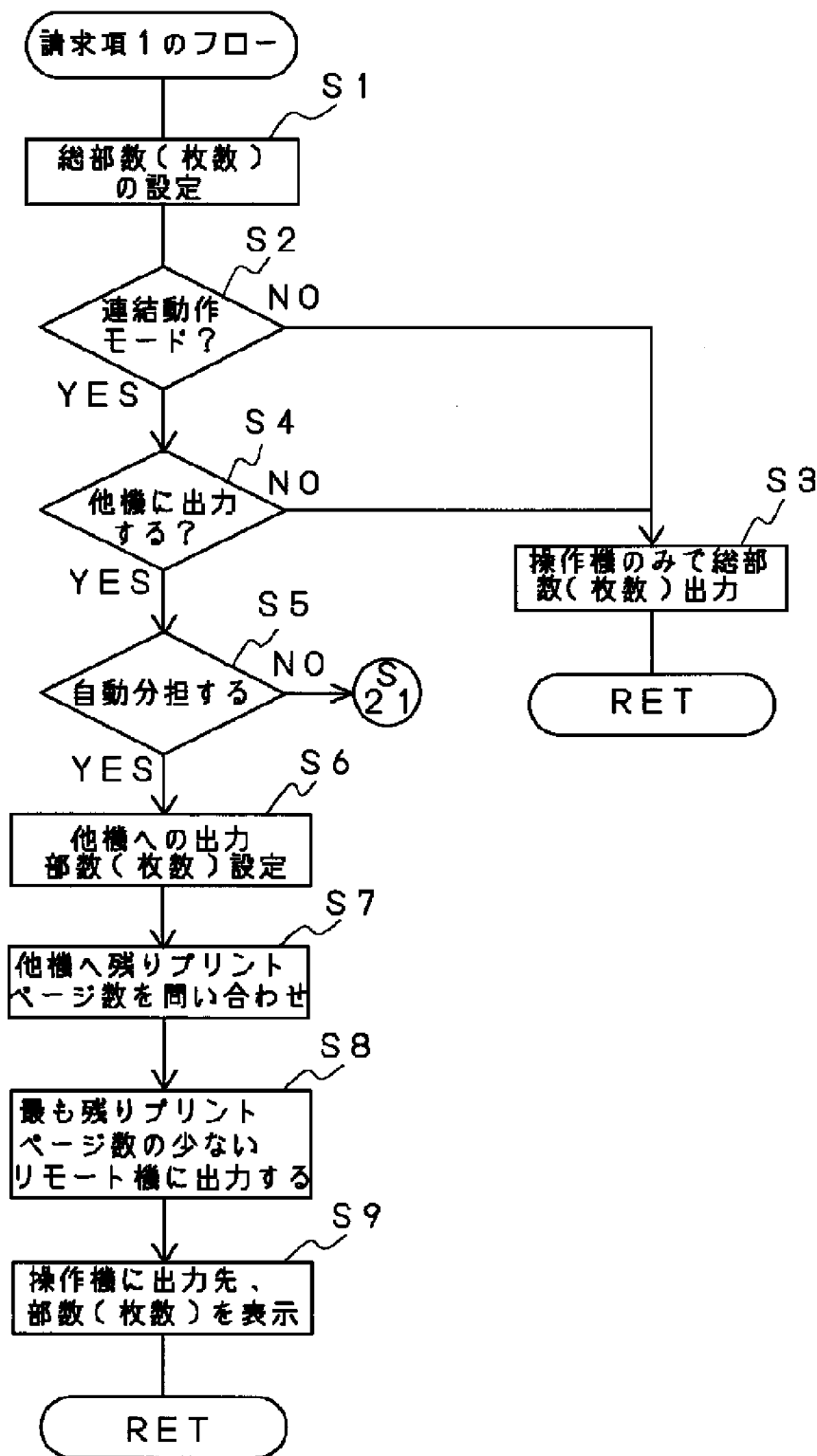
[Drawing 30]



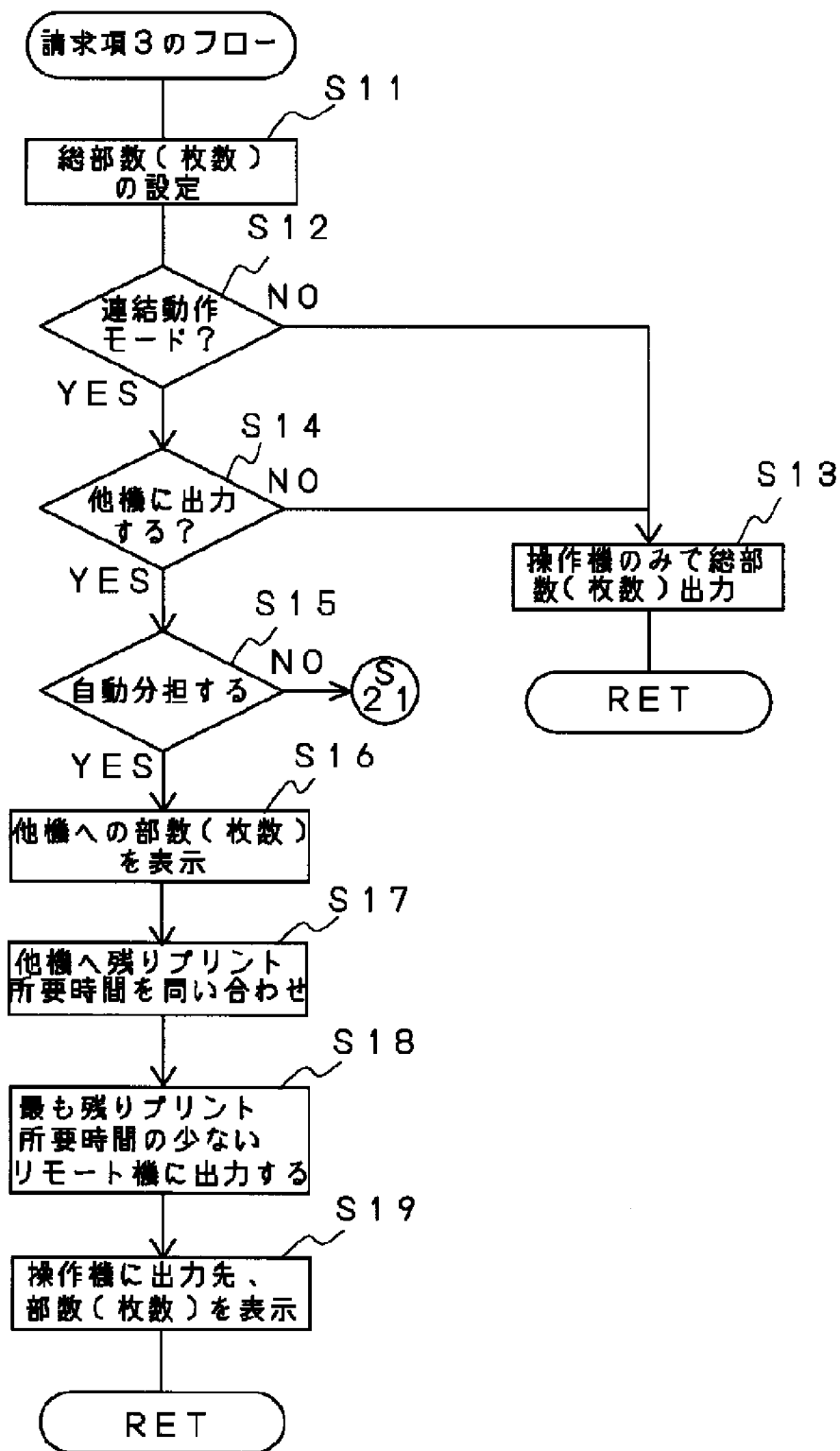
[Drawing 16]



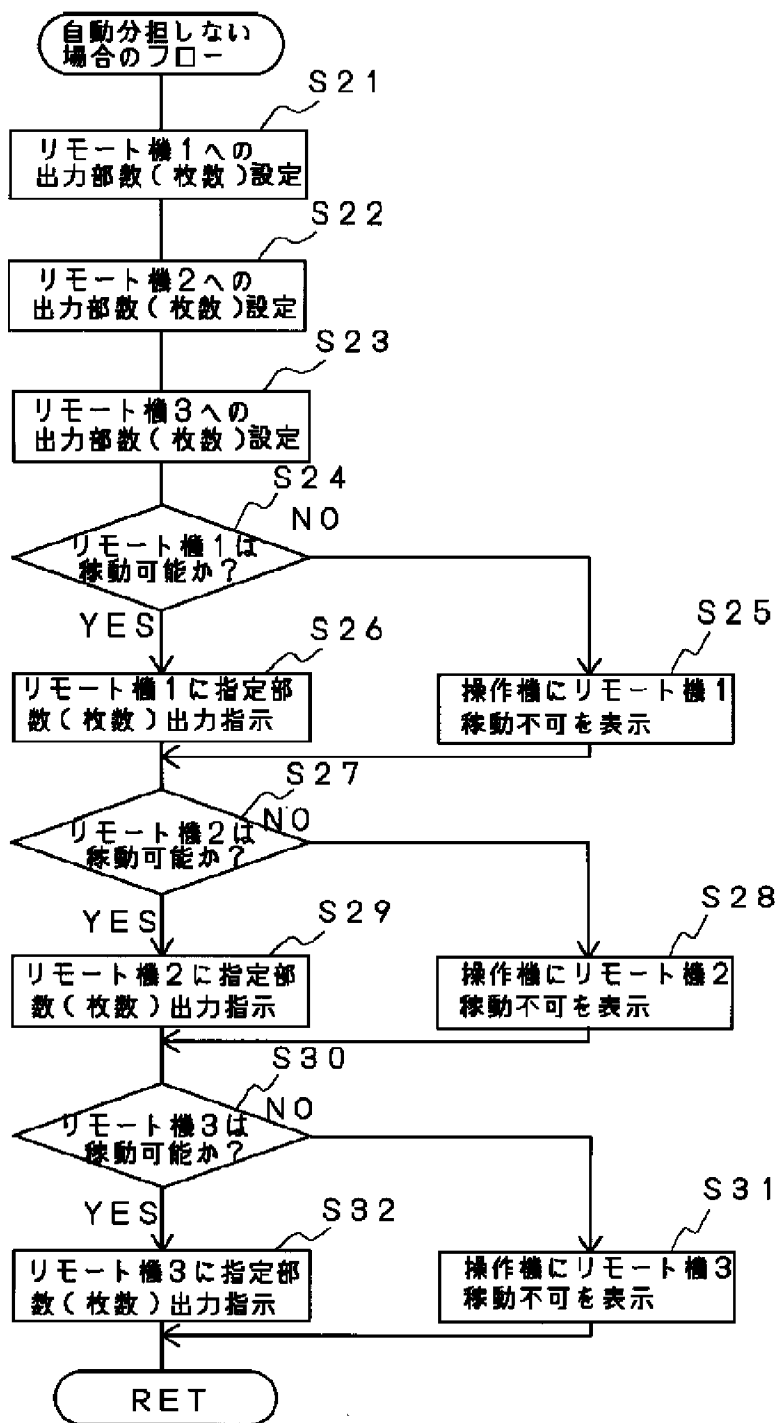
[Drawing 18]



[Drawing 19]



[Drawing 20]



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the network system of the image forming device which connected two or more digital image forming devices via the means of communication which communicates a motion command, a state, picture information, etc.

[0002]

[Description of the Prior Art]Two or more image signal output means, such as an image scanner which outputs a picture signal for more various purposes than before, a word processor, and a personal computer, The system which combined the image forming means of two or more printers which perform image formation with each of those picture signals, respectively is proposed. For example, two or more picture signal output units and two or more image forming devices are organically combined by each function, such as record of picture information, memory, and communication, and there is an image forming system which accessed from arbitrary places possible freely to other places so that JP,2-21190,B may see. A digital copier is connected and there is a system which raises copying operation speed so that JP,5-304575,A may see.

[0003]

[Problem(s) to be Solved by the Invention]Two or more image signal output means, such as an image scanner which outputs a picture signal for various purposes as mentioned above, a word processor, and a personal computer, The system which combined the image forming means of two or more printers which perform image formation with each of those picture signals, respectively is already publicly known. By the way, in the conventional system, when it faced other connection machines sharing the image data read with the operation machine, and carrying out a printout and a connection machine was printing, the room of improvement was left behind in how productivity is maintained.

[0004]Then, an object of this invention is to provide the environment which a user is not made to do wait operation, and to provide the network system of the image forming device which can raise shortening of copying time, productivity, and the utilization ratio of a system, even if the image forming device which is going to carry out a printout is among movable.

[0005]

[Means for Solving the Problem]To achieve the above objects, the invention according to claim 1, In a network system of an image forming device which connected two or more digital image forming devices via a means of communication which communicates a motion command, a state, picture information, etc., A transfer means which transmits image data read by a reading means of an image forming device to other devices under connection, It has a data transmitting reception means which receives data transmitting, and a command transmission and reception means which transmits and receives a command among two or more devices, When it faced other connection machines sharing image data read with an operation machine, and carrying out a printout and a connection machine was printing, the ** print number of pages chose fewest connection machines, and was provided with a control means which carries out print operation.

[0006]In the invention according to claim 1, as for the invention according to claim 2, a control means performs control which displays the ** print number of pages of a connection machine on an indicator.

[0007]In a network system of an image forming device which connected two or more digital image forming devices via a means of communication with which the invention according to claim 3 communicates a motion command, a state, picture information, etc., A transfer means which transmits image data read by a reading means of an image forming device to other devices under connection, It has a data transmitting reception means which receives data transmitting, and a command transmission and reception means which transmits and receives a command among two or more devices, Image data read with an operation machine is faced other connection machines sharing and carrying out a printout, When a connection machine was printing, the print time required was deduced from the ** print number of pages and a paper size, few connection machines of the time required were chosen most, and it had a control means which carries out print operation.

[0008]In the invention according to claim 3, as for the invention according to claim 4, a control means performs control which displays the print time required of a connection machine on an indicator.

[0009]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described over an accompanying drawing. Drawing 1 is an entire configuration figure of a digital copier. This device comprises the device main frame 1, the automatic draft feeder (ADF) 2, and the burst

trimmer stacker 3. The device main frame 1, The contact glass 4, the image reading unit 5, the image writing unit 6, the laser output unit 7, the photo conductor 8, the development unit 9, the transportation belt 10, the fixing unit 11, the delivery unit 12, the double-sided feed unit 13, the 1st tray 14, the 2nd tray 15, the 3rd tray 16, It has the 1st sheet feeding device 17, the 2nd sheet feeding device 18, the 3rd sheet feeding device 19, and vertical carrying unit 20 grade.

[0010]The read unit 5 is provided with the exposure lamp 21, the 1st mirror 22, the 2nd mirror 23, the 3rd mirror 24, the lens 25, and CCD series 26. The writing unit 6 is provided with the image formation lens 27 and the mirror 28 besides said laser output unit 7. The delivery unit 12 is provided with the branching claw 29. ADF2 is provided with the manuscript stand 41 and the feed belt 42 grade. The burst trimmer stacker 3 is provided with the stapler 51, the stacker tray 52, and the staple tray 53 grade. A push on the start key on the final controlling element mentioned later will feed the position on the contact glass 4 with the manuscript sheaf which turned the image face of the manuscript up and was placed by the manuscript stand 41 of ADF2 with the feeding roller 43 and the feed belt 42 from the bottom manuscript.

[0011]The manuscript which reading ended after reading the image data of the manuscript on the contact glass 4 with the read unit 5 is discharged by the feed belt 42 and the discharge roller 44. When it is detected that the manuscript stand 41 has the following manuscript by the manuscript set detection 45, it is fed with the manuscript on the contact glass 4 like the Maehara draft. The feeding roller 43, the feed belt 42, and the discharge roller 44 are driven by a motor.

[0012]Paper is respectively fed to the transfer paper (paper) loaded into the 1st tray 14, the 2nd tray 15, and the 3rd tray 16 by the 1st sheet feeding device 17, the 2nd sheet feeding device 18, and the 3rd sheet feeding device 19, and it is conveyed to the position which contacts the photo conductor 8 with the vertical carrying unit 20. The image data read with the read unit 5 is written in the photo conductor 8 by the laser from the writing unit 6, and a toner image is formed by passing the development unit 9. And while a transfer paper is conveyed with the transportation belt 10 at rotation of the photo conductor 8 and uniform velocity, the toner image on the photo conductor 8 is transferred. Then, a picture is fixed with the fixing unit 11 and it is discharged by the aftertreatment apparatus 3 with the delivery unit 12.

[0013]The aftertreatment apparatus 3 can lead the transfer paper conveyed with the delivery unit 12 of the main part 1 in the direction and the direction of a staple treating part of the stacker tray 52. By changing the switching plate 54 upwards, a transfer paper is delivered to the stacker delivery tray 52 side via the stacker transportation roller 55 and the stacker paper ejecting roller 56. By changing the switching plate 54 downward, a transfer paper is conveyed by the staple tray 53 via the transportation rollers 57 and 58.

[0014]Whenever paper is delivered to one sheet, a paper end side is arranged by the jogger 59 of *****, and the transfer paper loaded into the staple tray 53 is filed by the stapler 51 with

a part of completion of a copy. The transfer paper group filed with the stapler 51 is stored by the staple completion delivery tray (fall tray) 60 with prudence.

[0015]On the other hand, the stacker tray 52 which is the usual delivery tray is a delivery tray movable forward and backward. For every copy part in which sorting was carried out by every manuscript or the image memory, the stacker tray 52 movable forward and backward moves forward and backward, and classifies the copy paper discharged in simple.

[0016]It is setting the branching claw 29 for a course change to the upper part, and once stocks in the double-sided feed unit 13 without feeding paper from each paper feed trays 14-16 and leading the formed transfer paper to the stacker tray 52 side, when forming a picture to both sides of a transfer paper.

[0017]Then, in order to transfer the toner image again formed by the photo conductor 8, paper re feeding of the transfer paper stocked by the double-sided feed unit 13 is carried out from the double-sided feed unit 13, it sets the branching claw 29 for a course change to the bottom, and leads it to the stacker tray 52. Thus, when creating a picture in both sides of a transfer paper, the double-sided feed unit 13 is used.

[0018]The photo conductor 8, the development unit 9, the transportation belt 10, the fixing unit 11, the delivery unit 12, each sheet feeding devices 17-19, and the vertical carrying unit 20 are driven with main motor capacity.

[0019]Drawing 2 is a layout pattern of a final controlling element. There are the liquid crystal touch panel 71, the ten key 72, the clearance/stop key 73, the printing key 74, mode Clear key 75, and the initial-setting key 76 in the final controlling element 70, Various kinds of function keys (a staple, a stack, sorting, variable power, etc.), number of copies, the message that shows the state of an image forming device, etc. are displayed on the liquid crystal touch panel 71.

[0020]Drawing 3 thru/or drawing 6 are the figures showing the 1st thru/or the 4th display example of the liquid crystal touch panel of a final controlling element. The key which shows the selected function by an operator touching the key displayed on the liquid crystal touch panel 71 is reversed black. When the details of a function must be specified (for example, if it is variable power variable power value etc.), the setting screen of a detailed function is displayed by touching a key. Thus, since dot displays are being used for the liquid crystal touch panel 71, it can perform the optimal display at that time graphically.

[0021]In drawing 3, the 1st message area 71a where the upper left displays the message of "it can copy", "waiting", etc., and its right, In the number-of-copied-sheets indicator 71b which displays the set number of sheets, and the bottom of it. The automatic concentration key 71c which adjusts image concentration automatically, the automatic paper selection key 71d which chooses a transfer paper automatically, The sort key 71e which specifies the processing which arranges one copy of copy at a time with page order, The stack key 71f which specifies the

processing which classifies a copy for every page, 71 g of staple keys which specify the processing which files at a time one copy of thing by which sorting application was carried out, The actual size key 71h which sets magnification to actual size, the variable power key 71i which sets expansion/reducing magnification, There are elimination / navigation key 71k which sets up the double-sided key 71j which sets up double-side mode, binding margin mode, etc., and 71 l. of connection mode keys which divide a lot of print operation into plurality, and print it out via the network of a digital copier. As for the mode chosen, a shading indication of the key is given.

[0022]Drawing 4 is a screen which sets up using which copying machine it realizes at the time of coupled modes. It chooses by carrying out the depression of the key of each copying machine. If setting out is completed and the depression of the setting-out termination key 71m will be carried out, it will become a screen of drawing 5 and coupled modes will be set up. If this mode carries out the depression of 71 l. of the connection mode keys, it will be canceled, and it serves as a display of drawing 3 by a re-depression.

[0023]Drawing 6 is a display example when it stops before becoming a toner end by pause of a part by a toner near end etc. A toner near end is shown in the message area 71a. It returns to drawing 1 again and operation until it carries out latent image formation of the image read means in this invention and the picture on a recording surface is explained. A latent image is potential distribution produced by changing a picture into light information and irradiating with it on a photo conductor side.

[0024]The read unit 5 comprises the contact glass 4 and the optical scanning system which lay a manuscript, and the optical scanning system comprises the exposure lamp 21, the 1st mirror 22, the lens 25, and CCD series 26 grade. The exposure lamp 21 and the 1st mirror 22 are fixed on the 1st carriage that is not illustrated, and the 2nd mirror 23 and the 3rd mirror 24 are fixed on the 2nd carriage that is not illustrated.

[0025]When reading a manuscript image, the 1st carriage and the 2nd carriage are mechanically scanned with the relative velocity of 2 to 1 so that light path length may not change. This optical scanning system is driven with the scanner drive motor which is not illustrated. A manuscript picture is read by CCD series 26, is changed into an electrical signal and processed. Image magnification changes by moving the lens 25 and CCD series 26 to a longitudinal direction in drawing 1. That is, corresponding to the specified magnification, a position is set as the longitudinal direction of the lens 25 and CCD series 26.

[0026]As mentioned above, the writing unit 6 comprises the laser output unit 7, the image formation lens 27, and the mirror 28, and is equipped with the rotating polygon (polygon mirror) which carries out constant-speed rotation by the laser diode and motor which are laser light sources at high speed in the inside of the laser output unit 7.

[0027]The laser beam irradiated from the laser output unit 7 polarizes by the polygon mirror

which carries out constant-speed rotation, passes along the image formation lens 27, and is turned up by the mirror 28, and condensing image formation is carried out on a photo conductor side. The exposure scanning of the laser beam which polarized is carried out in the direction which the photo conductor 8 rotates, and the direction (scanning direction) which intersects perpendicularly, and it records the line unit of the picture signal outputted from the selector of the image processing portion mentioned later. By repeating horizontal scanning with the predetermined cycle corresponding to the revolving speed and storage density of the photo conductor 8, a picture (electrostatic latent image) is formed on a photo conductor side. [0028]As mentioned above, the laser beam outputted from the writing unit 6 is irradiated by the photo conductor 8 of a picture imaging system. Although not illustrated, the beam sensor which generates a horizontal-scanning synchronized signal in the position which can irradiate with the laser beam near the end of the photo conductor 8 is arranged. The control signal for outputting and inputting the picture signal which the image recording start timing of a scanning direction controls and mentions later based on this horizontal-scanning synchronized signal is generated.

[0029]Drawing 7 is a block diagram showing an example of an image processing device (an image read section and an image writing part). the light irradiated from the exposure lamp 21 irradiates with a manuscript surface -- the catoptric light from a manuscript surface -- CCD series 26 -- an image formation lens -- image formation -- photoelectric conversion is received light and carried out and it changes into a digital signal by A/D converter 81. After a shading compensation is made by the shading correction part 82, as for the picture signal changed into the digital signal, MTF correction, gamma correction, etc. are made by the image processing portion 83.

[0030]In the selector 84, the change which changes the destination of a picture signal to the variable power parts 85 or the picture memory controller 86 is performed. According to a variable power rate, scaling of the picture signal which went via the variable power parts 85 is carried out, and it is sent to the writing unit 6. It has composition which can output and input a picture signal bidirectionally between the picture memory controller 86 and the selector 84.

[0031]Although not clearly shown in particular in drawing 7, an image processing device, So that the image data (for example, data outputted from data processing devices, such as a personal computer) supplied from the outside besides the image data inputted from the read unit 5 can also be processed, It has a function which chooses input and output of two or more data (the printing unit 93, the print synthesis sections 94 and 95). It has CPU87 which performs setting out in picture memory controller 86 grade, and control of the image reading unit 5 and the writing unit 6 and ROM88 which store the program and data, and RAM89. CPU87 performs writing of the data of the image memory 90, and read-out via the memory controller 86. The numerals 91 show an I/O Port and 92 shows a SCSI driver.

[0032]Drawing 8 is an internal block figure of a memory controller and an image memory. Drawing 9 is a figure showing the picture signal for 1 page in a selector. In drawing 9, the frame gating signal expresses the shelf-life of the vertical scanning direction of 1-page image data. A horizontal-scanning synchronized signal is a signal in every line, and becomes effective [a picture signal] with Ushiro's predetermined clock with which this signal rose. The signal which shows that the picture signal of a scanning direction is effective is a line gate signal.

[0033]These signals synchronize with pixel clock VCLK, and 1-pixel data is sent to one cycle of VCLK. To an image input and each output, the image processing device has a separate frame gating signal, a horizontal-scanning synchronized signal, a line gate signal, and the developmental mechanics of VCLK, and becomes realizable [the combination of various picture input and output].

[0034]As shown in drawing 8, the memory controller 86 has the block of the input data selector 101, the 102 or primary image synthesis section compression / expanding part 103, and the 104 or secondary output data selector compression / expanding part 105. Setting out of the control data to each block is performed from CPU87. The address in drawing 7 and data show image data, and the data connected to CPU87 and an address are not illustrated.

[0035]The image memory 90 consists of the primary secondary storage 106,107. The memory in which rapid access, such as DRAM, is possible is used for the primary storage 106 so that the data from the writing of the data to the memory 90 or the memory 90 at the time of a generating picture can be read at high speed synchronizing with [abbreviated] the transfer rate of inputted image data.

[0036]The size of the image data which processes divided the primary storage 106 into two or more area, and it has taken simultaneously the composition (interface part with a memory controller) which can be performed for input and output of image data. In order to enable execution of the input of image data, and an output to parallel respectively in the divided each area, it is connected to the interface with a memory controller by 2 sets of address data lines, the object for a lead, and the object for lights. Thereby, while inputting a picture into the area 1 (light), operation of outputting a picture from the area 2 (lead) is attained.

[0037]The secondary storage 107 is a mass memory which saves data, in order to perform composition of the inputted picture, and sorting. If the primary secondary storage 106,107 uses the element in which rapid access is possible, the primary 2 next will be fair, can process data, and control will also become comparatively easy, but. Since elements, such as DRAM, are expensive, to secondary storage, an access speed is not so quick, but a cheap mass recording medium is used and it has the composition of performing processing of an I/O data via a primary storage. By adopting the composition of the above image memories 90, it becomes possible to realize the image forming device which can process input and output of a lot of

image data, preservation, processing, etc. with cheapness and comparatively easy composition.

[0038]Next, the outline of operation of the memory controller 86 is explained. First, an image input (preservation to the image memory 90) is explained. The input data selector 101 chooses the image data which performs the writing from the inside of two or more data to the primary storage 106 of an image memory. The image data with the selected input data selector 101 is supplied to the image synthesis section 102, and performs composition with the data already saved at the image memory 90. The image data processed by the image synthesis section 102 is compressed by primary compression / expanding part 103, and writes the data after compression in the primary storage 106. After the data written in the primary storage 106 compresses further by secondary compression / expanding part 105 if needed, it is saved at the secondary storage 107.

[0039]Next, a generating picture (read-out from the image memory 90) is explained. At the time of a generating picture, the image data memorized by the primary storage 106 is read. When the picture used as an output object is stored in the primary storage 106, The image data of the primary storage 106 is elongated by primary compression / expanding part 103, and the data after extension or data after performing picture composition with the data after extension and input data is chosen and outputted by the output data selector 104.

[0040]The image synthesis section 102 processes selection (the dual output to a generating picture, the write back to the primary storage 106, and both output destination changes is also possible) of the output destination change of the data after composition (it has a phase adjustment function of image data) with the data of the primary storage 106, and input data, and composition, etc. When the picture used as an output object is not stored in the primary storage 106, after elongating by secondary compression / expanding part 105 and writing the data after extension in the primary storage 106 to the output object image data stored in the secondary storage 107, above-mentioned generating picture operation is performed hereafter.

[0041]In order to carry out a work assignment, it is necessary to perform transmission and reception of other digital copiers and commands, or image data but, and this is realized by this embodiment using a SCSI interface. The memory controller 86 of drawing 7 has realized it via the SCSI driver 92.

[0042]The block diagram and drawing 11 which drawing 10 shows the 1st example of hard structure of a digital copier are a block diagram showing the 2nd example of hard structure similarly. Although this invention constitutes the system from the image reading unit 5, the image writing unit 6, the system controller 111, the memory unit 112, the user restriction apparatus 113, the body detecting sensor 114, the telediagnosis device (CSS) 115, and the clock 116, The memory unit 112 is required only when realizing a memory function, and only considering realizing the usual copy function, it is not [memory unit] necessary. If it becomes

at a certain specific time, the clock 116 is required, only when booting machinery or realizing a weekly timer function [shut / weekly timer function].

[0043]The body detecting sensor 114 is required only when the user has approached in front of machinery at the time of remaining-heat mode, and realizing the function to cancel remaining-heat mode automatically.

[0044]Since it is a function which notifies a service center automatically or monitors mechanical run state/condition of use from a remote place when the error of the telediagnosis, i.e., machinery, occurs, it should be equipped with CSS115 only when such a function is required.

[0045]The DRAM block of the memory unit 112 in drawing 10 and drawing 11 is for memorizing the picture signal read in the image reading unit 5, and can transmit the image data saved to the image writing unit 6 according to the demand from the system controller 111. The compressed block is provided with compression functions, such as MH, MR, and an MMR system, can once compress the read picture, and can aim at improvement in the utilization ratio of a memory (DRAM). Rotation of a picture is realized by changing the address read from the image writing unit 6, and its direction. Control of image reading unit 5, image writing unit 6, memory unit 112, and CSS115 is controlling by the example of hard structure of drawing 10 only by 1CPU of the system controller 111.

[0046]On the other hand in the example of hard structure of drawing 11, CPU is given to the image reading unit 5, the image writing unit 6, and the memory unit 112, respectively, System hard structure can be freely constituted as the command from the system controller 111 to each controller is transmitted with the controlling signal line. User restrictions mean specifying, limiting and managing a user and have user restriction apparatus, recitation codes, etc., such as a coin rack, a key counter, a keycard, and a prepaid card, as a means for it here to permit use indefinitely.

[0047]A weekly timer function is a function which doubles with the one and OFF time which were set up for every day of the week, and one [a function / a power supply] and turns off a power supply. The operation for carrying out matching the time of the clock module for this function and operation of setting up one and OFF time for every day of the week are required.

[0048]Remaining-heat mode is the mode in which power consumption is saved, by constant-temperature(for example, 10 **)-lowering fixing temperature, controlling it, and erasing a final controlling element display. Setting out in this mode is performed by the keystroke by a final controlling element, and also after operation and operation are lost depending on machinery setting out, it is automatically set up after fixed time. This mode is canceled when the keystroke by a final controlling element and machinery setting out detect that people stood in front of machinery with the body detecting sensor.

[0049]Drawing 12 is a key map of the network system of a digital copier. Although the eight

digital copiers A-H are connected with the network interface in this example, it cannot be overemphasized that the number of digital copiers is not what is limited to this.

[0050]Drawing 13 is a block diagram showing the example of hard structure of two connected digital copiers. For example, digital copier A and B are the hard structure shown in drawing 10, respectively. Since the image data from transmission or a network is saved on an external network at the DRAM block part in the memory unit 112, the picture read in the memory unit 112, SCSI117 and SCSI controller 118 are used as a network means. Various means, such as using TCP/IP communication of an OSI (Open System Interface) reference model for data communications, can be considered using Ethernet as a physical means in a network communication means with a natural thing.

[0051]Transmission of the state notification of each machinery which exists on a network inside the plane, control commands like the remote output command mentioned later, and a setting command is also performed not to mention transmission of image data as mentioned above by using composition as shown in the figure.

[0052]Next, the operation (the following, remote output) which transmits the picture read by the hard structure shown in drawing 10 to the image writing unit 6 of the hard structure shown in drawing 11 is explained.

[0053]Drawing 14 is a key map of the software of two connected digital copiers. the copy shown in a figure -- the application which performs a copy sequence for the application 121 to perform copying operation. The input/output control 122 is raya (device driver) which carries out logic / physical conversion of the data, the raya (a LCD display -- the light, / and) in which the final controlling element controller 123 performs MMI (Man Machine Interface) [LED-] With a logical level, are a keystroke scan etc. the raya to perform and the peripheral machine controller 124, It is the raya which performs control of the peripheral machine with which copying machines, such as an automatic double-sided unit, a sorter, ADF, are equipped with a logical level, The image forming device controller 125 and the image reader controller 126 are controllers of the image writing unit 6 and the image reading unit 5, respectively.

[0054]The memory unit 118 is as aforementioned. The daemon process 127 exists in image data read-out saved in the memory unit 118, and an image forming device as application which performs the duty which transmits image data, when a print request is requested from other machinery on a network. Before the daemon process's 127 reading a picture from the memory unit 118 with a natural thing and performing print operation, the image transfer from other machinery on a network must be ended and placed.

[0055]Here, a final controlling element, a peripheral machine, an image forming device, an image reader, and a memory unit are treated as a resource (resources) which each copying machine holds. A resource means the functional unit unit shared from two or more applications. The system controller 111 is performing system control in this resource unit.

When digital copier A of the figure performs copying operation using each own resource (at the time of a print start key depression), Each resource of a peripheral machine and a memory unit is required of a system control part from the system controller 111 an image forming device, an image reader, or if needed.

[0056]a system control part -- a copy -- arbitrating the royalty of a resource to the demand from the application 121 -- a copy -- the mediation result (use propriety) is notified to the application 121. the resource which a system holds in the case (state by which network connection is not carried out) where digital copier A is used by a stand-alone -- all -- a copy -- since the application 121 is in the state which can be occupied, copying operation is performed immediately.

[0057]The royalty of a resource is required from the system controller 111 of the remote digital copier which performs print operation like this invention on the other hand using the resource of another machinery (henceforth, remote digital copier) which exists on a network. The system controller 111 of a remote digital copier arbitrates a resource according to a demand, and notifies the result to the application of the machinery of a requiring agency. Application performs image transfer to the memory unit 118 of the machinery of a RIMODO output destination change via an external interface (this embodiment SCSI117), after performing reading of a picture and completing the image storage into the own memory unit 118, when a royalty is permitted.

[0058]After image transfer is completed and transmitting the monograph affairs (a paper feed port, a delivery port, print number of sheets, etc.) for carrying out print execution to the daemon process 127 of the machinery of the remote output point, a printing start command is transmitted. If the daemon process 127 of the remote output point receives a printing start command, a printing start will be required from the own (machinery which performs a remote output) system controller 111, and a remote output will be performed by the system controller 111. When the memory unit 118 of digital copier B is used by digital copier A, As for the memory unit 118 of digital copier B, use of the application of digital copier B (digital copiers other than digital copier A when [or] two or more digital copiers as shown in drawing 12 are connected on a network) is improper.

[0059]Drawing 15 is an explanatory view showing an example of the operation outline of the electronic sort mode at the time of connecting operation (function which accumulates and sorts a picture in a memory). The case where copied six copies of three manuscripts and sorting operation is carried out by one more set of an operation machine and machinery is shown. Among one set of an operation machine (master machine) and a slave machine, copy operation is shared and it is operating. The operation machine side usually operates manuscript reading operation and print operation simultaneously. Actual operation is performing in parallel operation which writes the picture in the memory 118, printing a scanner

image as it is. After the end of the 1st copy print operation, a picture is read from the memory 118, the 2nd copy is printed, and print operation of the 3rd copy is performed after the end.

[0060]The slave machine side makes the memory 118 memorize the picture sent from an operation machine. Whether that picture can be printed in parallel takes for the performance of the memory unit 118 at this time. Here, print operation is performed after the end of memory storage operation. It is processed with the 2nd copy and the 3rd copy after the end of a print of the 1st copy. The number of specification parts is printed by halves as shown here, but also when this assignment can be set up freely and one of machinery is interrupted, it is also easily possible to change assignment number of copies of a part unit. The number of the remainders under discontinuation can be assigned.

[0061]Drawing 16 is an explanatory view showing other examples of the operation outline of the electronic sort mode at the time of connecting operation (function which accumulates and sorts a picture in a memory). Drawing 16 shows the example of operation kept from performing print operation simultaneously at the time of manuscript reading operation. When it is detected that there are few residues of a supply, this example operates only reading operation so that it may not become a supply end in the middle of a part.

[0062]Drawing 17 is a lineblock diagram of the managerial system of a digital copier. The controlling device 131 currently installed in the service base and digital copier A-E currently installed in a user's origin are connected via the public network 132. The communication controlling device 133 for controlling communication with the controlling device 131 is installed in the user side, and the digital copier of user origin is connected to this communication controlling device 133. The communication controlling device 133 is connectable [the telephone 134 or the facsimile 135], and installation is possible in the form inserted in a user's existing circuit.

[0063]Although two or more digital copiers are connectable, of course, there may be the singular number in the communication controlling device 133. A model which does not need to be of the same type and is different is also available for these digital copiers, and any apparatus other than a digital copier is also available for them. Here, after [expedient] explaining, the one communication controlling device 133 is used [that a maximum of five digital copiers are connectable and]. Multidrop connection of the communication controlling device 133 and two or more digital copiers is carried out by RS-485 standard.

[0064]Communications control between the communication controlling device 133 and each digital copier is performed by the basic mode data transmission control procedure.

Communication with arbitrary digital copiers is attained by establishing a data link with the polling selecting mode of the centralized control which made the communication controlling device 133 the control station. Each digital copier can set up a peculiar value now with an address setting switch, and the polling address of each digital copier and a selecting address

are determined by this.

[0065]Next, the embodiment corresponding to an invention given in a claim is described based on drawing 18 thru/or drawing 30.

[0066]Drawing 18 is a flow chart of the operation processing which shows a 1st embodiment (it corresponds to the invention according to claim 1). Drawing 21 thru/or drawing 30 are the figures showing the 5th thru/or the 14th display example of the liquid crystal touch panel of a final controlling element. Setting out (they are nine sheets as shown in drawing 21) of total number of copies (number of sheets) first printed to an operation machine is performed (S1). If many print setting out and setting out in connecting operation mode are performed on the final controlling element screen represented by drawing 21 and it is set as coupled modes (it is Y at S2), the screen (71 m of the 2nd message area; drawing 22) which asks whether it outputs to other connection machines will be taken out to the final controlling element 70 (S4).

[0067]Here, even if it has case and set up, in [which is not made into connecting operation mode] not carrying out the output to other connection machines, total number of copies (number of sheets) set up only with the operation machine is printed, and it ends processing (S3).

[0068]In going into coupled modes and outputting to many opportunities, according to the "automatic assignment operation setting" which the user set up beforehand, it changes the print distribution to a connection machine in the setting-out mode represented on the screen of drawing 23.

[0069]A 1st embodiment is a case where the above "automatic assignment operation setting" is set up (it is Y at S5), and sets up the number of outputting parts to an operation machine and a connection machine (number of sheets) in the setting screen represented by drawing 24 (S6). It is made for the sum of the number of set parts of an operation machine and a connection machine (number of sheets) to become the same to total number of copies (number of sheets) set up first at this time. Then, the print number of sheets of each connection machine is asked (S7).

[0070]In a connection machine side, if it is states, such as "it being waiting" etc. ""during manuscript reading and a print"", and "under print" to an inquiry, "The remaining print number of pages" is transmitted, based on these information, if a print is assigned to which connection machine, it will judge whether it is the earliest and the output instruction for the number of set parts (number of sheets) will be taken out with the operation machine side (S8). When the copy of an assignment ends an operation machine and a connection machine, an output destination change and number of copies (number of sheets) are displayed on the final controlling element 70 of an operation machine, as shown in drawing 25 (S9).

[0071]In the invention according to claim 2, the number of outputting parts to an operation machine and a connection machine (number of sheets) is set up by the flow of a 1st

embodiment. Then, the print time required of each connection machine is asked. Like a 1st embodiment, by a connection machine side, if it is states, such as "it being waiting" etc.

"during manuscript reading and a print", and "under print" to an inquiry, From "the total print number of pages", the "transfer paper size", and "print speed (CPM)" of a copying machine which were read with the manuscript automatic feeder (ADF) 2, "the remaining print time required" is computed and it transmits.

[0072]Based on these information, if a print is assigned to which connection machine, it will judge whether it is the earliest and the output instruction for the number of set parts (number of sheets) will be taken out with the operation machine side. When the copy of an assignment ends an operation machine and a connection machine, an output destination change and number of copies (number of sheets) are displayed on the final controlling element 70 of an operation machine as shown in drawing 25.

[0073]Drawing 19 is a flow chart of the operation processing which shows a 2nd embodiment (it corresponds to the invention according to claim 3). By a 2nd embodiment shown in drawing 19, to having remained in other opportunities at Step S7, and having asked the PERINTO number of pages in a 1st embodiment shown in drawing 18. Processing of Steps S11 thru/or S19 of a 2nd embodiment is the same as a 1st embodiment except remaining in other opportunities at Step S17, and asking the print time required.

[0074]As it is in claim 2 and the invention according to claim 4, during a print the information on the "remaining print number of pages" obtained from each connection machine, and the "remaining print time required" here to 71 m of the 2nd message area of the liquid crystal touch panel 71 of the final controlling element 70 of an operation machine. It displays, as shown in drawing 26 and drawing 27. By doing in this way, when the user can ** if the print waiting state of each connection machine is grasped in real time, and he improves the availability of a system, he can do effective usage.

[0075]Drawing 20 is a flow chart of the operation processing which shows a 3rd embodiment. This flow chart is a thing when not setting up the above "automatic assignment operation setting." That is, in N, it shifts to S21 of drawing 20 in S5 of drawing 18 S15 of the case of N, and drawing 19.

[0076]The connection machine (remote machine) and the number of outputting parts (number of sheets) which a user wants to output are set up arbitrarily in the setting screen represented by drawing 28 and drawing 29 (S21-S23). It is made for the sum of the number of set parts of an operation machine and a connection machine (number of sheets) to become the same to total number of copies (number of sheets) set up first at this time. Then, the operating status of the connection machine containing an operation machine and which carried out output setting out is seen in young numerical order (S24, S27, S30), and the output instruction for the number of set parts (number of sheets) is taken out to the connection machine which can work

(S26, S29, S32).

[0077]When the copy of an assignment ends an operation machine and a connection machine to the connection machine in the state where it cannot copy with SC, jam, etc., the state is displayed on the final controlling element of an operation machine, as shown in drawing 30 (S25, S28, S31).

[0078]

[Effect of the Invention]According to the invention according to claim 1, since it is parallel to an operation machine among two or more image forming devices (connection machine) and copy operation can be performed, shortening of time can be aimed at and productivity can be raised. Since the remaining print number of pages makes auto select of the fewest image forming devices and is printed even when other image forming devices under connection are printing, the user can leave the spot, without carrying out waiting for a print, and can raise the efficiency as a system.

[0079]Since a user can recognize waiting time by displaying the remaining print number of pages on a final controlling element in an operational image forming device on a trusted system according to the invention according to claim 2, The time of the waiting for a print can be used effectively and the efficiency as a system can be raised.

[0080]According to the invention according to claim 3, the same effect as the invention according to claim 1 is done so.

[0081]According to the invention according to claim 4, the same effect as the invention according to claim 2 is done so by displaying the remaining print time required on a final controlling element.

[Translation done.]